CLAIMS

What is claimed is:

1. A communication system comprising:

a receiver structured to receive a substantially continuous sine wave carrier signal, the signal modulated to contain communication data;

a demodulator communicating with the receiver, the demodulator structured to demodulate the communication data from the substantially continuous sine wave carrier signal; and

a transmitter coupled to the demodulator, the transmitter including an electromagnetic pulse generating circuit, with the electromagnetic pulse generating circuit structured to transmit a plurality of electromagnetic pulses, with the pulses configured to include the communication data.

2. The communication system of claim 1, wherein the substantially continuous sine wave carrier signal is selected from a group consisting of: an amplitude modulated signal, a phase angle modulated signal, a frequency angle modulated signal, an orthogonal frequency division multiplexing modulated signal, a quadrature amplitude modulation signal, a dual sideband modulated signal, a single sideband modulated signal, and a vestigial sideband modulated signal.

3. The communication system of claim 1, wherein the substantially continuous sine wave carrier signal has a radio frequency bandwidth that may range between about 10 kilohertz to about 5 megahertz.

4. The communication system of claim 1, wherein the demodulator is selected from a group consisting of: an amplitude demodulation circuit, a quadrature amplitude demodulation circuit, a frequency angle demodulation circuit, a phase angle demodulation circuit, and an orthogonal frequency division demodulating circuit.

5. The communication system of claim 1, wherein the electromagnetic pulse generating circuit comprises:

a control unit;

at least two current sources;

at least two switching elements connected to the current sources, each of the switching elements structured to receive a signal from the control unit;

a switch connected to the at least two switching elements, the switch structured to receive a signal from the control unit; and

a load connected to the switch.

6. The communication system of claim 5, further comprising:

a first set of resistive elements connected to the current sources, and to the switching elements, the resistive elements also connected to a second voltage level.

7. The communication system of claim 5, further comprising:

a second set of resistive elements connected to the switching elements, and to the switch, the second set of resistive elements also connected to the second voltage level.

8. The communication system of claim 5, wherein the current sources are comprised of at least one transistor.

9. The communication system of claim 5, wherein each of the at least two switching elements comprise at least one transistor.

10. The communication system of claim 5, wherein the switch comprises an inverter.

11. The communication system of claim 5, wherein the load is selected from a group consisting of: a resistive element, an energy storage element, and a capacitor.

12. The communication system of claim 1, wherein each of the plurality of electromagnetic pulses may vary in amplitude from about –5 volts to about 5 volts.

13. The communication system of claim 1, wherein each of the plurality of electromagnetic pulses may have a duration ranging from about 1 pico-second to about 1 milli-second.

14. The communication system of claim 1, wherein the communication data is segmented into individual components selected from a group consisting of: received data, routing information, destination information, quality-of-service information, bit-error-rate information, priority information and latency information.

15. The communication system of claim 1, wherein the communication data is received in a first communication format, segmented, and re-assembled in a second communication format.

16. The communication system of claim 15, wherein the second communication format comprises an ultra-wideband communication format.

17. The communication system of claim 15, wherein the first communication format includes a format selected from a group consisting of: a substantially continuous sine wave carrier signal format; an amplitude modulated signal format, a phase angle modulated signal format, a frequency angle modulated signal format, an orthogonal frequency division multiplexing modulated signal format, a quadrature amplitude modulation signal format, a dual sideband modulated signal format, a single sideband modulated signal format, and a vestigial sideband modulated signal format.

18. The communication system of claim 1, further including a first transmission medium coupled to the receiver, wherein the receiver receives the substantially continuous sine wave carrier signal through the first transmission medium.

19. The communication system of claim 18, wherein the first transmission medium is a wireless medium.

20. The communication system of claim 18, wherein the first transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

21. The communication system of claim 1, further including a second transmission medium coupled to the transmitter, wherein the transmitter transmits the plurality of electromagnetic pulses through the second transmission medium.

22. The communication system of claim 21, wherein the second transmission medium is a wireless medium.

23. The communication system of claim 21, wherein the second transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

24. The communication system of claim 1, wherein each of the plurality of transmitted electromagnetic pulses occupies substantially the same radio frequency spectrum.

25. The communication system of claim 1, wherein each of the plurality of electromagnetic pulses is transmitted so that each pulse occupies a discrete portion of the radio frequency spectrum.

26. A communication system comprising:

a receiver structured to receive a plurality of electromagnetic pulses, with the electromagnetic pulses configured to include communication data;

a demodulator communicating with the receiver, the demodulator structured to demodulate the communication data from the plurality of electromagnetic pulses; and

a transmitter coupled to the demodulator, the transmitter including an electromagnetic pulse generating circuit, with the electromagnetic pulse generating circuit structured to transmit a substantially continuous sine wave carrier signal, with the substantially continuous sine wave carrier signal modulated to contain the communication data.

27. The communication system of claim 26, wherein the electromagnetic pulse generating circuit comprises:

a control unit;

a first set of current sources connected to a first voltage;

a first set of switching elements connected to the first set of current sources, each of the first set of switching elements structured to receive a signal from the control unit;

a switch connected to the first set of switching elements, the switch structured to receive a signal from the control unit;

a second set of switching elements connected to the switch, each of the second set of switching elements structured to receive a signal from the control unit;

a second set of current sources connected to the second set of switching elements, each of the second set of current sources connected to a second voltage level; and

a load connected to the switch, and to the second voltage level.

28. The communication system of claim 26, wherein the electromagnetic pulses may vary in amplitude from about –5 volts to about 5 volts.

29. The communication system of claim 26, wherein the electromagnetic pulses may have a duration from about 1 pico-second to about 1 milli-second.

30. The communication system of claim 26, wherein the substantially continuous sine wave carrier signal is selected from a group consisting of: an amplitude modulated signal, a phase angle modulated signal, a frequency angle modulated signal, an orthogonal frequency division multiplexing modulated signal, a quadrature amplitude modulation signal, a dual sideband modulated signal, a single sideband modulated signal, and a vestigial sideband modulated signal.

31. The communication system of claim 26, further including a first transmission medium coupled to the receiver, wherein the receiver receives the plurality of electromagnetic pulses through the first transmission medium.

32. The communication system of claim 31, wherein the first transmission medium is a wireless medium.

33. The communication system of claim 31, wherein the first transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

34. The communication system of claim 26, further including a second transmission medium coupled to the transmitter, wherein the transmitter transmits the substantially continuous sine wave carrier signal through the second transmission medium.

35. The communication system of claim 34, wherein the second transmission medium is a wireless medium.

36. The communication system of claim 34, wherein the second transmission medium is selected from a group consisting of: an optical fiber ribbon, a fiber optic cable, a single

mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

37. The communication system of claim 26, wherein the communication data is segmented into individual components selected from a group consisting of: received data, routing information, destination information, quality-of-service information, bit-error-rate information, priority information and latency information.

38. The communication system of claim 26, wherein the communication data is received in a first communication format, segmented, and re-assembled in a second communication format.

39. The communication system of claim 38, wherein the first communication format comprises an ultra-wideband communication format.

40. The communication system of claim 38, wherein the second communication format includes a format selected from a group consisting of: a substantially continuous sine wave carrier signal format; an amplitude modulated signal format, a phase angle modulated signal format, a frequency angle modulated signal format, an orthogonal frequency division multiplexing modulated signal format, a quadrature amplitude modulation signal format, a dual sideband modulated signal format, a single sideband modulated signal format, and a vestigial sideband modulated signal format.

41. A method of transmitting data, the method comprising the steps of:

receiving data;

demodulating the data;

providing an electromagnetic pulse generating circuit;

generating a plurality of electromagnetic pulses arranged to represent the demodulated data; and

transmitting the plurality of electromagnetic pulses.

42. The method of transmitting data of claim 41, wherein the step of generating a plurality of electromagnetic pulses comprises means for generating a plurality of electromagnetic pulses.

43. The method of transmitting data of claim 41, wherein the transmitted electromagnetic pulses are either a plurality of single-band electromagnetic pulses or a plurality of multi-band electromagnetic pulses.

44. The method of transmitting data of claim 41, wherein the received data comprises a substantially continuous sine wave carrier signal that includes modulated data.

45. The method of transmitting data of claim 41, wherein step of transmitting the plurality of electromagnetic pulses comprises transmitting a plurality of multi-band

electromagnetic pulses that have a radio frequency bandwidth that may range between about 200 megahertz to about 1 gigahertz.

46. The method of transmitting data of claim 41, wherein step of transmitting the plurality of electromagnetic pulses comprises transmitting a plurality of single-band electromagnetic pulses have a radio frequency bandwidth that may range between about 2 gigahertz to greater than 10 gigahertz.

47. The method of transmitting data of claim 41, wherein the steps of receiving data and transmitting the plurality of electromagnetic pulses comprise:

receiving the data and transmitting the plurality of electromagnetic pulses through a medium, the medium selected from a group consisting of: a wireless medium, an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi-mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.